WHAT IS CLAIMED IS:

1. A method for characterizing the permittivity of a molecular event, the method comprising:

obtaining a first permittivity value for a test sample, the test sample comprising:

a known molecular event; and

a buffer;

obtaining a second permittivity value for a reference sample, the reference sample containing the buffer; and

computing the difference between the first and second permittivity values, wherein the computed difference represents the permittivity of the known molecular event.

2. A method for detecting the presence or absence of a known molecular event in a test sample, the method comprising:

obtaining a first permittivity value for a reference sample, the reference sample known to either (1) contain the known molecular event, or (2) exclude the known molecular event;

obtaining a second permittivity value for a test sample suspected of containing the known molecular event;

computing the difference between the first and second permittivity values, wherein the similarity or difference between

computing the difference between the first and second permittivity values, wherein the computed difference represents the permittivity of the known molecular event.

3. A method for determining the relative difference between the permittivity of a test sample and the permittivity of a reference sample, the method comprising:

providing a detector configured to supply output parameters when the detector is electromagnetically coupled to a supplied sample;

defining one or more permittivity coefficients for the detector;

7   obtaining a first output parameter from the detector when the detector is

8   electromagnetically coupled to a reference sample;

9   obtaining a second output parameter from the detector when the detector is

10   electromagnetically coupled to the test sample;

11   applying the difference between the first and second output parameters to

12   the one or more permittivity coefficients to compute the relative difference in permittivity

13   between the test sample and reference sample.